

This was easily reduced by a Bunsen flame, so as to represent a metallic prism with an angle of some 20 seconds. Only one in twenty of the prisms could be used, and only one in 200 silver or gold prisms. The source of light was a zirconium burner with a red shade transmitting light of the mean wave-length 64×10^{-7} cm. The index of refraction was found to vary with the incidence. For perpendicular incidence the following values were found: Au 0.26, Ag 0.35, Cu 0.48, Pt 1.99, Ni 2.01, Iron 3.02, Co 3.16. For silver the index was 0.39 at an incidence of 10° , 0.60 at 30° , 0.80 at 50° , 1.01 at 80° , and 1.03 at 90° . The following refractive indices for various wavelengths illustrate the dispersion:

	Li, α	D	F	G
Au ...	0.29	0.66	0.82	0.93
Ag ...	0.25	0.27	0.20	0.27
Cu ...	0.35	0.60	1.12	1.13
Pt ...	2.02	1.76	1.63	1.41

—On a law of refraction for the entrance of light into absorptive media, by H. E. J. G. du Bois and H. Rubens.—On the infrared emission spectra of the alkalis, by Benjamin W. Snow.—Absolute change of phase in light by reflection, by Paul Glan.—Inductance representation of the theory of double refraction, by Franz Koláček.—Studies in the electric theory of light, by D. A. Goldhammer.—On the passage of feeble currents through electrolyte cells, by Rud. Lohnstein.—On the motion of the lines of force in the electro-magnetic field, by Willy Wien.—On the electric theory of magneto-optic phenomena, by D. A. Goldhammer.—An automatic interruptor for accumulators, by H. Ebert. This is to prevent the current from the accumulator exceeding the supply for which it is constructed. Two mercury cups are inserted in the circuit, connected by a piece of stout copper wire. The current next passes through an electro-magnet. As soon as the current reaches a certain strength the electro magnet overpowers an adjustable spring, and lifts the copper connecting-piece out of the cups.—Contribution to the history of the spheroidal phenomena, by G. Berthold.

SOCIETIES AND ACADEMIES.

LONDON.

Physical Society, October 28.—Dr. J. H. Gladstone, F.R.S., past president, in the chair.—The discussion on Mr. Williams's paper, "On the relation of the Dimensions of Physical Quantities to Directions in Space," was opened by Prof. Perry reading a communication from Prof. Fitzgerald, president. The writer said Mr. Williams disagreed with the suggestion that electric and magnetic inductive capacity are quantities of the same kind principally because he had not got over the curious prejudice that potential and kinetic energy are different. No theory of the ether could be complete unless it reduced its energy to the kinetic form. Electric and magnetic inductive capacity would probably be found to be similar in the ether, and ultimately have the same dimensions. The analogies were not yet complete, but only in respect of *matter* was it probable that any difference existed between them. Diamagnetism corresponded to electrostatic induction, but paramagnetism had no definite electrical analogue. He was inclined to regard the phenomena of paramagnetism as connected with the arrangement of the material molecules, whilst diamagnetism depended on the electric charges on those molecules. So far no matter had been found which conducts magnetism, and such may not exist in our universe, but it may be gravitationally repelled by matter as we know it.—Mr. Madan remarked that in the first part of his paper Mr. Williams recognized that dimensional formulæ were originally change-ratios, but puts this aside for the higher conception which regards the formulæ as expressing the nature of the quantity. Fourier showed how to find the dimensions of units by making the size of the fundamental units vary. But k (specific inductive capacity) did not vary with the fundamental units, for it was merely the ratio of the capacities of two condensers, and therefore, by Mr. Williams's definition, a pure number. It was difficult, he said, to see how k could have dimensions, but Mr. Williams regarded it as a physical quantity, and therefore possessing dimensions. The object in giving dimensions to k and μ seemed to be to get over the double system of units. Mr. Madan did not think that dimensions could express the nature of physical quantities, and said differences of opinion existed amongst authorities on this point. For example, Dr. J. Hopkinson, at the last B.A. meeting, said that because a co-efficient of self-induction had the dimensions of

length it must be a length, whilst other learned professors objected to this view. Even if one admitted that dimensions are a test of the nature of physical quantities it was not necessary that the two systems of units should be identical. The connecting link between the two systems was $Q = C \cdot t$, and the validity of this equation had been questioned. If this objection be confirmed, then there would be no current in electrostatics and no Q in the electromagnetic system, and the units would not clash. Referring to dynamical units, Mr. Madan pointed out that two units of mass were used in astronomy, but astronomers got over the difficulty by using a co-efficient. Dimensional formulæ, he said, are the result of a convention that certain definitions should hold true generally, but they contain no further information respecting the nature of the quantities beyond that involved in those definitions. As an example of the inability of such formulæ to express the nature of quantities, he pointed out that whilst physical differences were known to exist between + and - electricity the dimensional formulæ showed no signs of such differences.—Prof. Rücker said every correct physical equation consisted of a numerical relation between physical quantities of the same kind, and might be written either as a mere numerical equation or as a relation between the physical quantities themselves. The equation $2 + 1 = 3$ may correspond to 2 feet + 1 foot = 3 feet, and the latter may be written $2[L] + 1[L] = 3[L]$, where $[L]$ represents the unit of length. So far as he was aware, nobody but a recent writer in the *Electrician* had denied that in such an equation $[L]$ represented a concrete quantity. Maxwell explicitly stated that it does in his article on "Dimensions" ("Encycl. Britt.") and elsewhere, and Prof. J. Thomson, in his paper on the same subject, makes no statement contrary to this. The above equation might also be written $2[\text{foot}] + 1[\text{foot}] = 3[\text{yard}]$. Another equation involving time is $60[\text{sec.}] = 1[\text{minute}]$, and dividing one by the other one gets

$$\frac{1}{60} \left[\frac{\text{foot}}{\text{sec.}} \right] + \frac{1}{60} \left[\frac{\text{foot}}{\text{sec.}} \right] = 1 \left[\frac{\text{yard}}{\text{min.}} \right].$$

A difficulty was felt here in understanding what dividing a foot by a second meant; but this difficulty Prof. Rücker considered was not greater than that involved in dividing an impossible by a real quantity, a very familiar analytical device. Reasons for regarding the symbols $\left[\frac{\text{foot}}{\text{sec.}} \right]$ as legitimate were then given.

Prof. Henrici said the communication under discussion was one of the most important contributions to physical science which he had come across for a long time. Such difficulties as presented themselves in the paper arose from its fundamental character. The author had attempted to express all physical quantities in terms of three, but quantities may exist which cannot be completely represented in terms of L , M and T . The tendency of modern mathematics was to express everything dynamically. Mathematicians had long been in the habit of using quantities which were neither numbers nor concretes in the ordinary sense, and different kinds of algebra with units not understandable had been developed. If a quantity, a times a unit u , be multiplied by b times another unit v , the result is expressed by $ab uv$, where ab is a number and uv a new unit which may or may not be physically interpretable. The interpretation of a product depended on the meaning attached to "multiplication," and if this be restricted to "repeated addition" the range is very limited. The narrow conceptions concerning multiplication acquired at school could only be removed by a careful study of vectors. Mr. Williams had treated his subject by vector methods, but a few traces of quaternions remained which might be omitted. To truly understand the subject, vectors must be treated vectorially. Dimensions might then show the nature of the quantities involved. The system adopted in Mr. Williams's paper was probably the best attainable at present, but he (Prof. Henrici) looked forward to the use of a more fundamental quantity than the vector—viz. "the point"—as the ultimate basis. Grassmann had worked out a "point calculus" in 1844, which was republished in 1880. Quantities more complex than vectors, viz. rotors, screws, motors, &c., had been used with advantage by Clifford, Ball, and others. Dr. Sumpner thought the first ideas of students on the subject of dimensions were that they represented the nature of the quantities, but could not see why every quantity should be expressed in terms of L , M and T . Prof. Rücker's paper on "Suppressed Dimensions" had cleared up several important points, and he (Dr. Sumpner) now considered that every quantity

must be expressed in terms of a unit of the same kind as itself. He viewed Mr. Williams's attempt to express everything in terms of L , M and T , as rather a retrograde step. The discussion on Mr. Williams's paper was adjourned, and Dr. Young made some remarks on Mr. Sutherland's communication "On the Laws of Molecular Force." Mr. Sutherland, he said, thought that Ramsay and Young's law $\partial p / \partial T = f(v)$ is not correct for compounds in the liquid state. Barus, however, had proved that several liquids, including ether, only showed variations from the law at extremely high pressures. After writing the equation of the virial in the form $p v = RT \nu f(v) + v \phi(v)$, where $\nu \phi(v)$ stands for the internal virial term; the author of the paper had shown that $\nu^2 \phi(v)$ ought to be constant, but, finding it not constant in the case of ether, &c., he attempted to explain the discrepancies by the formation of pairs of molecules at small volumes. Other substances, such as nitrogen and methane, were supposed to follow the law. This, Dr. Young said, could not be accepted as proved, for the range of volumes over which the experiments had been made was only small, and methane was difficult to prepare pure. After criticizing the use of two and sometimes three "characteristic equations" for the same substance, he went on to show that the formulæ given in the paper by which the critical temperatures, pressures, and volumes might be calculated, lead to results differing from experimental numbers by quantities greatly in excess of experimental errors. Experiment also showed that capillarity had little or no effect on the determination of critical constants. Speaking of critical volumes he pointed out that MM. Cailletet and Mathias had published a method of finding critical densities which gave very accurate results. Mr. Sutherland's conclusions respecting Van der Waals's generalizations were practically identical with those expressed by Dr. Young in his paper on the subject, read before the Society last year. The views as to the nature of the various kinds of "pairing" mentioned in Mr. Sutherland's paper were open to serious objections, for his "physical pairing" is supposed to produce more effect on the "characteristic equation" than true chemical pairing. In his (Dr. Young's) opinion the idea of physical pairing appears somewhat speculative and requires further elucidation.—A paper on the determination of the critical density, by Dr. Young and Mr. A. L. Thomas, and two papers, on the determination of the critical volume, and on the boiling points of different liquids at equal pressures, by Dr. Young, were taken as read. The first paper gives an account of results obtained by Cailletet and Mathias's method, based on the fact that the means of the densities of a substance in the states of liquid and saturated vapour when plotted with temperature, lie on a straight line which passes through the critical point. In the paper on critical volumes the above-mentioned method is again referred to and results obtained thereby accepted in preference to those given by the author in his paper on Generalizations of Van der Waals, &c., read before the Society about a year ago. The alcohols do not strictly follow the straight-line law. Revised tables of critical volumes, densities, pressures, and temperatures, are given, and it is pointed out that for many substances the ratio of the actual critical density to the theoretical density (for a perfect gas) is about 3.8. The paper on boiling-points of different liquids at equal pressures contains a comparison of the accuracies with which a formula for the relation between the boiling-points given by M. Colst (*Compt. Rend.*, cxiv. p. 653), and one by Ramsay and Young (*Phil. Mag.*, January 1886), accord with experimental results. The author concludes that the latter formula shows the best agreement, but that of M. Colst is satisfactory under certain conditions. The further discussions of Mr. Williams's and Mr. Sutherland's papers were adjourned till the next meeting.

Mineralogical Society, October 25.—At the Anniversary Meeting the following were elected Officers and Members of Council:—President, Prof. N. S. Maskelyne, F.R.S.; Vice-Presidents, Rev. Prof. S. Haughton and Dr. Hugo Müller, F.R.S.; Treasurer, Mr. F. W. Rudler, F.G.S.; General Secretary, L. Fletcher, F.R.S.; Foreign Secretary, Mr. T. Davies; Ordinary Members of Council, Prof. A. H. Church, F.R.S.; Prof. Grenville A. J. Cole, Mr. T. W. Danby, Dr. C. Le Neve Foster, F.R.S., the Rev. H. P. Gurney, Mr. J. Horne, Prof. J. W. Judd, F.R.S., Prof. G. D. Liveing, F.R.S., Lieut. General C. A. McMahon, Mr. H. A. Miers, Mr. F. Rutley, and Mr. J. J. H. Teall, F.R.S.—Dr. C. O. Trechmann detailed the results of the goniometrical measure-

ment of two very perfect crystals of Binnite collected by himself in the Binnenthal. The measurements, besides adding a large number of forms to those previously recorded for this species, serve to establish the tetrahedral hemisymmetry of the mineral which has been left as a very doubtful feature by previous observers, and was denied by Hessenberg.—Mr. H. A. Miers and Mr. G. T. Prior announced the results of further researches on the rare silver minerals known as Xanthoconite and Rittingerite. According to their physical measurements and chemical analyses these two substances are identical, both having the same composition as Proustite, and crystallizing in rhombic-shaped tables belonging to the mono-symmetric system. The name Xanthoconite, given by Breithaupt, has the priority; the red-silver ores are now to be regarded as an isodimorphous (?) group consisting of the two sulph-arsenites Proustite and Xanthoconite, and the two sulph-antimonites Pyrgargyrite and Fireblende. Previous determinations of the composition of Rittingerite and the crystalline form of Xanthoconite have been erroneous.—Mr. Fletcher gave a description of a new habit of Descloizite from the Argentine, and also an account of the new mineral Baddeleyite (native zirconia): the only fragment as yet found is part of a twinned crystal showing forms which belong to the mono-symmetric system: pleochroic: optically negative and biaxial with inclined dispersion: specific gravity 6.025: hardness 6.5.—Mr. Allan Dick contributed further remarks on Geikielite, supplementing his paper read at the previous meeting.—Prof. Judd exhibited photographs in illustration of his previous paper on the lamellar structure of quartz crystals and the method by which it is developed.—Mr. Rutley exhibited a large series of beautiful cardboard models illustrative of the symmetry and optical characters of the crystalline systems.—Mr. Miers exhibited specimens, including the rare mineral Turnerite from the Tintagel Slate quarries which he had visited in search of that mineral.

Zoological Society, November 1.—Sir W. H. Flower, F.R.S., President, in the chair.—The Secretary read a report on the additions that had been made to the Society's Menagerie during the months of June, July, August, and September, 1892, and called special attention to a young Gibbon from Hainan, South China, of a uniform black colour, belonging to the species recently described by Mr. Oldfield Thomas as *Hylobates hainanus*, presented by Mr. Julius Neumann, and to a young male Malayan Tapir (*Tapirus indicus*) from Tavoy, Burmah, presented by Col. F. M. Jenkins.—Mr. E. Hartert exhibited (on behalf of the Hon. Walter Rothschild) examples of two new Mammals from New Guinea (*Proechidna nigro-acculeata* and *Acrobates pulchellus*), and a stuffed specimen of *Apteryx maxima* from Stewart Island.—A communication was read from Lord Lilford, giving an account of the breeding of a pair of Demidoff's Galagos in his possession.—Prof. Bell read a note on the occurrence of *Bipalium kewense* in Ireland.—Mr. Finn gave an account of his recent zoological excursion to Zanzibar.—Prof. Newton, F.R.S., exhibited and made remarks on a specimen of *Sylvia nisoria* lately killed in England.—Prof. F. Jeffrey Bell read a description of a remarkable new species of Echinoderm of the genus *Cidaris* from Mauritius, proposed to be called *C. curvatispinis*.—A communication was read from Sir Edward Newton, and Dr. Gadow, F.R.S., describing a collection of bones of the Dodo, and other extinct birds of Mauritius, which, having been recovered from the Mare aux Songes in that island by the exertions of Mr. Theodore Sauzier, had been by him entrusted to them for determination. The collection contained examples of the atlas, metacarpals, pre-pelvic vertebra, and complete pubic bones of the Dodo, which had been before wanting, as well as additional remains of *Lophopsittacus*, *Aphanapteryx*, and other forms already known to have inhabited Mauritius. Besides these there were bones of other birds, the existence of which had not been suspected, and among them of the following, now described as new:—*Strix (?) sausieri*, *Astur alphonssi*, *Butorides mauritanus*, *Plotus nanus*, *Sarcidiornis mauritanus* and *Anas theodori*, the whole adding materially to the knowledge of the original fauna of Mauritius.—Mr. Oldfield Thomas gave an account of a collection of Mammals from Nyassa-land, transmitted by Mr. H. H. Johnston, under whose directions they had been obtained by Mr. Alexander Whyte.—Dr. Günther, F.R.S., read a paper descriptive of a collection of reptiles and Batrachians from Nyassa-land, likewise transmitted by Mr. Johnston, and containing examples of several remarkable new species, amongst which were three new Chameleons, proposed to be called

Chamaeleon isabellinus, *Rhampholeon platyceps*, and *R. brachyurus*.—Mr. R. Lydekker read a memoir on some Zeuglodont, and other Cetacean remains from the Tertiaries of the Caucasus.—Mr. Martin Jacoby read the descriptions of some new genera and new species of Phytophagous Coleoptera from Madagascar.

Linnean Society, November 3.—Prof. Stewart, President, in the chair.—The Rev. Prof. Henslow exhibited an instrument used in Egypt for removing the end of the sycamore fig, and gave some account of the mode of cultivation.—Mr. A. Smith Woodward exhibited and made remarks on some supposed fossil lampreys (*Paleospondylus gunni*) from the old red sandstone of Caithness.—The Rev. E. S. Marshall exhibited some hybrid willows from Central Scotland, believed to be rare or new to Britain.—Mr. G. N. Douglass exhibited the train of a peahen which had assumed the male plumage. The bird, which was reared at the Castle Farm, Tilquhillie, near Banchory, N.B., was believed to be about thirty years old at the time of its death, and for some years previously had not laid any eggs. In the opinion of the exhibitor and others present the phenomenon was correlated with disease of the ovaries. Similar cases had occurred with fowls, pheasants, and black game, but not, so far as was known, with peafowl.—Mr. C. T. Drury exhibited some new examples of apospory in ferns, namely a specimen of *Athyrium filix-femina* var. *clarissima* with pinnæ showing development of prothalli by soral apospory, and a seedling *Lastrea pseudomas cristata*, showing prothalli developed aposporously over general surface of frond (pan-apospory).—Mr. J. E. Harting exhibited some live specimens of the short-tailed fieldvole (*Arvicola agrestis*), and gave an account, from personal inspection of the serious damage done by this little rodent upon the sheep-pastures in the lowlands of Scotland.—Mr. A. B. Rendle exhibited some seedling plants of the sugarcane which had been raised in this country by Mr. Veitch.—The discussion on several of these exhibitions having continued until a late hour, a paper by Prof. Henslow, on a theoretical origin of endogens through an aquatic habit, was by consent adjourned to the next meeting of the Society, which will be held to-day.

Mathematical Society, November 10.—Prof. Greenhill, F.R.S., President, in the chair.—This was the annual general meeting and after the election of the gentlemen whose names are given on p. 616 (NATURE, vol. xlv.) to serve on the council for the session 1892-93, the new President, Mr. A. B. Kempe, F.R.S., took the chair and at once called upon the retiring president to read his valedictory address. Prof. Greenhill took as his subject collaboration in mathematics.—The following further communications were made. Some properties of homogeneous isobaric functions, by E. B. Elliott, F.R.S. This paper is a sequel to one which the writer communicated at the June meeting entitled a proof of the exactness of Cayley's number of seminvariants of a given type. The earlier part of the present paper supplies omissions in the preceding one and in the remainder the theorem on which Mr. Elliott's argument was based is transformed, and the result examined for its own sake without reference to the particular application.—On certain general limitations affecting hyper-magic squares, by S. Roberts, F.R.S. The paper does not aim at making any addition to the known ways of constructing magic squares. Hyper-magic squares, as the writer regards them, include those called by M. E. Lucas "carrées diaboliques," and also treated by Mr. A. H. Frost under the designation of "Nasik squares." The special form is of ancient origin. The second method given by Moschopolus (thirteenth century) is a general one for forming such squares and they have been discussed by various modern authors. The writer's object is to show some limitations to which they are subject when the elements are positive or negative integers. Incidentally it appears that hyper-magic squares of oddly even orders cannot be formed of series of consecutive natural numbers. There is some reason for believing that much ingenuity has been fruitlessly employed in trying to form such squares. We may here mention that a very interesting historical essay on the subject of magic squares has been published by Dr. Siegmund Günther, in his work entitled "Vermischte Untersuchungen zur Geschichte der Mathematischen Wissenschaften" (Leipzig 1876). The subject has also been brought into connection with the "Geometry of Tissues," by M. Lucas and others (see the "Principii Fundamental della Geometria dei Tessuti," par Edoardo Lucas, Torino, 1880).—Note on the equation $y^2 = x(x^4 - 1)$ by Prof. W. Burnside.—Note on

secondary Tucker circles by Mr. J. Griffiths. The idea of this note sprang from the fact that if G, g , are two inverse points with respect to the circumcircle (ABC) whose centre is O i.e. such that $OG \times Og = R^2$, then the pedal triangles DEF, *def* of G, g , with regard to ABC are similar. Taking G to be one of the Brocard points, then (DEF) is a Tucker circle and (*def*) a secondary circle.—On a group of triangles inscribed in a given triangle ABC whose sides are parallel to connectors of any point P with A, B, C , by Mr. Tucker. If DEF, $D'E'F'$, are a pair of such triangles they are readily seen to be in perspective. Their properties are considered with reference to the principal points and lines of the modern geometry of the triangle.—A note on triangular numbers by Mr. R. W. D. Christie.

PARIS.

Academy of Sciences, November 7.—M. de Lacaze-Duthiers in the chair.—Letter addressed to the President by the committee formed to celebrate the seventieth birthday of M. Pasteur.—Influence of the distribution of manures in the soil upon their utilization, by M. H. Schloësing.—Note on the reply of M. Berthelot to my note of October 24, by M. Th. Schloësing.—Comparison of the magnetic observations of General Pevzoff in Central Asia with the data of the English magnetic charts, by M. Alexis de Tillo. General Michael Pevzoff, in his last exploring tour in Eastern Turkestan, made some careful determinations of magnetic declinations and inclinations. If these are compared with those published by M. Creach in the report of the *Challenger* expedition, it appears that in declination an average correction of $+1^\circ.7$ has to be applied to the latter, while the inclinations are practically identical.—On the new triangulation of France, by M. L. Bassot. This work was commenced in 1870. It comprised the establishment of a continuous chain between the Spanish frontier and Dunkerque, supporting the net on three base lines, and attaching it as far as possible to each of the parallel chains of the old triangulation. Also a new determination of the co-ordinates of the Panthéon, the fundamental point of the triangulation, the measurements of base-lines in terms of the international metrical standard, and the calculation of the new arc of meridian. It was found that, starting from the Paris base-line, the network was verified at Perpignan, at a distance of 6° , to within 1 in 250,000. Where the French system meets the English, Belgian, and Italian systems, the correspondence is found practically perfect, but on the Spanish frontier there exists a difference of 1 in 65,000 at present unexplained. The arc between Dunkerque and Carcassonne, as now calculated, exceeds that of Delambre by $44.7m.$, or 1 in 20,000.—Essay on a general method of chemical synthesis, by M. Raoul Pictet.—On the fifth satellite of Jupiter, by M. E. Roger. From the empirical formula for the distances of Jupiter's satellites

$$\log \text{hyp } a = 8 - \frac{3m}{2\pi} - 0.03 \cos \frac{m\pi}{5} + \epsilon$$

the probable distances of any satellites yet undiscovered can be calculated. It appears that there may be one at distance 1.97, two others at 1.61 and 1.27, or a single one at 1.425, and others beyond the outermost satellite. The distances of those already known are 2.50, 6.05, 9.62, 15.35, and 27.00.—On the transformations of dynamical equations, by M. Paul Painlevé.—Lenticular liquid microglobules and their conditions of equilibrium, by M. C. Maltézos. The smallest drops of a liquid jet falling upon another liquid often assume a lenticular shape, one surface of which is more curved than the other. These are called microglobules. Their diameters were measured, and their volumes and masses calculated. The production of microglobules in all the liquids in Quincke's table was experimented upon.—Effects of weight on fluids at the critical point, by M. Gouy.—Dilatation of iron in a magnetic field, by M. Berget. An elegant experiment to exhibit the lengthening of an iron bar on magnetization, on the principle of Newton's rings. The bar in question, provided with a cap of black glass, presses against the flat side of a plano-convex lens screwed to the same stand. The bar is surrounded by a coil, which can be excited by a battery of accumulators. Magnetization is at once indicated by the expansion of the rings. On the dissipation of the electric energy of the Hertz resonator, by M. V. Bjerknes (see *Wiedemann's Annalen*, No. 9).—On the equality of potential at the contact of two electrolytic deposits of the same metal, by M. G. Gouré de Villemontée.—On the rotating power of the diamine salts, by M. Albert Colson.—Volumetric determination of the alkaloids, by M. E. Léger.—On the fixation of free nitrogen by

plants, by MM. Th. Schlösing, jun., and Em. Laurent.—Observations on the preceding note, by M. Duclaux.—Observations on the preceding communications, by M. Berthelot.—On γ -achroglobine, a new respiratory globuline, by M. A. B. Griffiths.—On the axinite of the Pyrenees, its forms and its conditions of occurrence, by M. A. Lacroix.—On the subterranean river of the Tindoul de la Vayssière and the springs of Salles-la-Source (Aveyron), by MM. E. A. Martel and G. Gaupillat.—On the comparative anatomy of the stomach in Ruminants, by M. J. A. Cordier.—Remarks on some means of defence in the æolians, by M. E. Hecht.—On the evolution of the brachial apparatus of some brachiopods, by MM. P. Fischer and D. P. Ehlert.—On the mechanism of solution of starch in plants, by M. A. Prunet.—On the diuretic and ureopoeitic action of the alkaloids of cod-liver oil on man, by M. J. Bouillot.—Results obtained at the crystal works of Baccarat by the introduction of metastannic acid into putty powder, by M. L. Guérout.

BERLIN.

Physiological Society, October 14.—Prof. Munk, president, in the chair.—Prof. Kossel gave an account of further researches on nucleic acid, a compound which, in union with albumin, composes the proteids of the cell-substance. In earlier researches he had studied the acid as derived from yeast-cells and salmon-milt, and found that while the substances obtained from these two sources differed in many respects, they resembled each other in that the ratio of phosphorus to nitrogen was in both as 1 to 3, and that they both yielded nuclein-bases during their decomposition. More recent researches on the nuclein derived from the leucocytes of the thymus gland have shown that the nucleic acid it yields is more like that from milt, and resembles the product obtained from yeast even less than does the product from milt. The relationships of nucleic acid to the chromatin bodies of the histologists were minutely considered.—Prof. Gad brought forward a theory of the excitatory process in muscles, based upon the theory of Fick, but further developed and supported by experiments on tetanized muscles.

DIARY OF SOCIETIES.

LONDON.

THURSDAY, NOVEMBER 17.

ROYAL SOCIETY, at 4.30.—On the Characters and Behaviour of the Wandering (Migrating) Cells of the Frog, especially in Relation to Micro-organisms: Dr. Kanthack and W. B. Hardy.—On the Colour of the Leaves of Plants and their Autumnal Changes: Dr. Hassall.—Stability and Instability of Viscous Liquids: A. B. B. set, F.R.S.—Observations on the Earthquake Shocks which occurred in the British Isles and France during the Month of August, 1892: Prof. Hull, F.R.S.

LINNEAN SOCIETY, at 8.—A Theoretical Origin of Endogens through an Aquatic Habit: Rev. Prof. Henslow.—On the Buprestidae of Japan and their Coloration: G. Lewis.

CHEMICAL SOCIETY, at 8.—Fluo-sulphonic Acid: T. E. Thorpe, F.R.S., and William Kirman.—The Interaction of Iodine and Potassium Chlorate: T. E. Thorpe, F.R.S., and George H. Perry.—The Magnetic Rotation of Sulphuric and Nitric Acids and their Solutions: also of Solutions of Sodium Sulphate and Lithium Nitrate: W. H. Perkin, F.R.S.—Note on the Refractive Indices and Magnetic Rotation of Sulphuric Acid Solutions: S. U. Pickering, F.R.S.—Hydrates of Alkylamines: S. U. Pickering, F.R.S.—On the Atomic Weight of Boron: W. Ramsay, F.R.S., and Miss Emily Aston.—And other papers.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Problems of Commercial Electrolysis: James Swinburne (Discussion.)

LONDON INSTITUTION, at 6.—Lincoln Cathedral (Illustrated): Rev. Canon Edmund Venables.

SUNDAY, NOVEMBER 20.

SUNDAY LECTURE SOCIETY, at 4.—How Weather Forecasts are arrived at, and how we should use them (with Oxy-hydrogen Lantern Illustrations): Arthur W. Clayton.

MONDAY, NOVEMBER 21.

SOCIETY OF ARTS, at 8.—The Generation of Light from Coal Gas: Prof. Vivian B. Lewis.

ARISTOTELIAN SOCIETY, at 8.—The Nature of Physical Force and Matter: R. J. Ryle.

LONDON INSTITUTION, at 5.—Respiration in Man and Animals (Illustrated): Hy. Power.

TUESDAY, NOVEMBER 22.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Halifax Graving-Dock, Nova Scotia: Hon. R. C. Parsons.—Cockatoo Island Graving-Dock, New South Wales: E. W. Young.—The Alexandra Graving-Dock, Belfast: W. Redfern Kelly.—Construction of a Concrete Graving-Dock at Newport, Monmouthshire: Robert Pickwell. (Discussion.)

WEDNESDAY, NOVEMBER 23.

GEOLOGICAL SOCIETY, at 8.—Outline of the Geological Features of Arabia Petrea and Palestine: Prof. Edward Hull, F.R.S.—The Marls and Clays of the Maltese Islands: J. H. Cooke.—The Base of the Keuper Formation in Devon: Rev. A. Irving.

SOCIETY OF ARTS, at 8.—Cremation as an Incentive to Crime: F. Seymour Haden.

THURSDAY, NOVEMBER 24.

INSTITUTION OF CIVIL ENGINEERS, at 2.30.—Students' Visits to the Gas Light and Coke Company's Chief Office, Horseferry Road, Westminster. **LONDON INSTITUTION**, at 6.—The Ruined Cities of Mashonaland (Illustrated): J. Theodore Bent.

FRIDAY, NOVEMBER 25.

PHYSICAL SOCIETY, at 5.—Experiments in Electric and Magnetic Fields, Constant and Varying: E. C. Rimington and E. Wythe Smith.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—The Value of Hypnotism in Chronic Alcoholism: Dr. C. L. Tuckey (Churchill).—Guide to the Science of Photo Micrography, 2nd edition: E. C. Bousfield (Churchill).—Das Centralnervensystem von Protopterus Annectens: Dr. R. Burckhart (Berlin, Friedländer).—Aids to Experimental Science: A. Gray (Auckland, Upton).—The Outlines of Organic Chemistry: C. J. Leaper (Iliffe).—Théorie Mathématique de la Lumière: H. Poincaré (Paris, G. Carré).—A Sequel to the First Six Books of the Elements of Euclid, 6th edition: Dr. J. Casey, edited by P. A. E. Dowling (Longmans).—The Jurassic Rocks of the Neighbourhood of Cambridge: T. Roberts (C. J. Clay).—Fossil Plants as Tests of Climate: A. C. Seward (C. J. Clay).—The Collected Papers of Sir Wm. Bowman, Bart., F.R.S.: vol. 1, Researches in Physiological Anatomy, edited by Prof. J. Burdon-Sanderson; vol. 2, Surgical and Ophthalmological Papers, edited by J. W. Hulke (Harrison).—The Fayum and Lake Moëris: Major R. H. Brown (Stanford).—Text-book of the Embryology of Man and Mammals: Dr. O. Hertwig, translated by Dr. E. L. Mark (S. S. S. S.).

PAMPHLETS.—A Sanitary Crusade through the East and Australia (Glasgow, Boyle).—Geologische und Geographische Experimente; ii. Heft, Vulkanische und Massen-Eruptionen: E. Reyer (Leipzig, Engelmann).—The Gods of Greece, and other Translations: Dr. J. F. Whitty (Grocok).—First Series of Field-path Rambles round Brimley, &c.: W. Miles (Taylor).—Un Avance à la Antropologia de España: L. de Hoyos Sáinz and T. de Aranzadi (Madrid).—Appunti in Conferma delle Osservazioni Tromometriche: P. T. Bertelli (Torino, Giuseppe).

SERIALS.—Journal of the Royal Horticultural Society, vol. xiv.; Report of the Conifer Conference (London).—Himmel und Erde, November (Berlin, Paetel).—Bulletin de la Société Impériale des Naturalistes de Moscou, 1892, No. 2 (Moscow).—Quarterly Journal of Microscopical Science, November (Churchill).—The Kansas University Quarterly, October (Lawrence, Kansas).

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